

Whiteflies in Winter Vegetables

WINTER VEGETABLES HAVE FOUND A HOME in southwestern Arizona, along with the insect pests that go with them. In recent years, the mild winter climate has attracted many growers to Yuma County. Lettuce in particular has proved successful: in the 1992-93 growing season, nearly 47,500 acres were planted to head lettuce.

But to the sweetpotato whitefly, that equals 47,500 acres of potential feeding and nesting areas. Not only does this pest feed on vegetable and field crops, directly damaging the leaves, it also transmits viruses in the process.

The sweetpotato whitefly (*Bemisia tabaci*) has bugged growers in the Southwest since 1989. This pesky fly, measuring 1/16 inch, is a tiny sap-sucking insect capable of causing severe economic damage to vegetable and field crops.

In 1992, the whitefly caused widespread damage in Arizona vegetable crops, totalling \$55 million in yield losses. Between 1991 and 1993, UA research scientist John Palumbo and other researchers counted as many as 3000 whitefly eggs per square inch on broccoli and cauliflower leaves in Yuma County.

"We have seen total destruction of early fall plantings because whiteflies have extracted a large amount of the phloem sap," Palumbo said. Phloem is the plant's food-conducting tissue.

Palumbo is studying the insecticides and application methods that work best in bringing this tiny bug under control in research plots and commercial fields in Yuma. For the last few years, he has developed whitefly sampling and monitoring plans, evaluated application technology, and studied the effects of newly developed insecticides on the whitefly and its natural enemies. The Western Region Pesticide Impact Assessment, USDA, and the Arizona Iceberg Lettuce Research Council have sponsored the research, along with portions of the agrichemical industry.

By studying the ecology and management of key pests in lettuce and cole crops (broccoli, cauliflower), Palumbo hopes to determine how whiteflies injure crops and what works to keep the whitefly from destroying these vegetables. Within the last year, Palumbo has found that conventional insecticide



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programs are marginally effective and are often very expensive.

He recently began exploring the use of charged spraying on vegetable crops. Commonly known as electrostatic spraying, this method uses static electricity to increase the attraction between insecticide spray droplets and the plant surface. According to Palumbo, this method enables a larger amount of the spray to reach the plant's surface and adhere to it. This allows a greater amount of the chemical to reach the underside of the leaves, where the whiteflies live and feed.

"It's a primary method of reducing the amount of insecticide applied," Palumbo explained. The better the substance sticks to the leaves, the less it is needed in large doses.

Cotton has been the whitefly's major target in Arizona; the insect overwinters in Yuma after the cotton has been harvested, ready to infect new cotton plantings. Until recently, scientists did

not understand how the whitefly survived in Arizona beyond the cotton season. Then they realized the whiteflies were migrating from cotton fields to vegetable crops very rapidly. Researchers found that whiteflies can survive in vegetable plantings 365 days a year, making these crops good hosts for the insect. During the last three years, the whitefly has adapted to lettuce, broccoli and cauliflower, in particular.

Palumbo believes there may be an intermediate crop contributing to the migration: he is currently looking into the possibility of alfalfa serving as a significant source for whiteflies migrating into vegetable fields in the desert Southwest.

— Crystal Renfrow

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